202201UECM3473OE3b

Start again

Review of preview

Started on	Friday, 4 March 2022, 02:25 PM
Completed on	Friday, 4 March 2022, 02:25 PM
Time taken	10 secs
Grade	**0** out of a maximum of 10 (**0**%)

1
Marks: 1

Assume an individual insured is selected at random from a population of insureds. The number of claims experienced in a given year by each insured follows a Poisson distribution. The mean value θ of the Poisson distribution is distributed across the population according to the following gamma distribution:

$$f(\theta) = 6/\Gamma(4)\theta^{3}e^{-6\theta},\ \theta > 0$$

Given that a particular insured experienced a total of 3 claims in the previous 4 years, what is the posterior estimate of the future expected annual claim frequency, given the experience of this particular insured? ______

Answer: ✗

Make comment or override grade

Incorrect
Correct answer: 0.7

Marks for this submission: 0/1.

2
Marks: 1

Claim sizes are normally distributed with mean θ and variance 120,000. θ varies by risk, and is normally distributed with mean 1,500 and variance 1,080,000. For a certain risk, 10 claims averaging 2100 are observed. Determine the posterior probability that θ is less than 2295.0. ______

Answer: ✗

Make comment or override grade

Incorrect
Correct answer: 0.9678

Marks for this submission: 0/1.

3
Marks: 1

The number of claims per year on an insurance coverage has a binomial distribution with parameter m = 5 and Q. Q varies by insured and is distributed according to the following density function:

$$f(q) = cq(1 - q)^{6},\ 0 \le q \le 1,$$

where c is a constant.
An insured submits 1 claims in 6 years. Calculate the posterior probability that for this insured, Q is less than 0.028. ______

Answer: ✗

Make comment or override grade

Incorrect
Correct answer: 0.089813

Marks for this submission: 0/1.

4
Marks: 1

We assume that the amount of an individual claim, Y , follows an exponential distribution function with probability density function

$$f(y|\delta) = 1/\delta e^{-y/\delta},\ y,\ \delta > 0$$

The mean claim amount, δ, follows an inverse gamma distribution with density function

$$\pi(\delta) = 4^3 e^{-4/\delta}/(\Gamma(3)\delta^4),\ \delta > 0$$

Suppose 22 claims are observed with total aggregate claim amount of 10. Find $P(Y_{23} > 1|\Sigma Y_i = 10)$. ______

Answer:

Make comment or override grade

Incorrect
Correct answer: 0.1782
Marks for this submission: 0/1.

5
Marks: 1

For an insurance portfolio with 1765 exposures, you are given:

- The number of claims for each exposure follows a Poisson distribution.
- The mean claim count varies by exposure. the distribution of mean claim counts is a gamma distribution with parameters $\alpha_1 = 0.75$, $\theta_1 = 4$.
- The size of claims for each exposure follows an exponential distribution.
- The mean claim size varies by exposure. The distribution of mean claim sizes is an inverse gamma distribution with parameters $\alpha_2 = 3$, $\theta_2 = 4$.
- the standard for full credibility of aggregate claims is that aggregate claims must be within 6% of expected 90% of the time.

Determine the credibility assigned to this portfolio. ______

Answer:

Make comment or override grade

Incorrect
Correct answer: 0.9384
Marks for this submission: 0/1.

6
Marks: 1

Losses follow a distribution with desity function

$$f(x) = \delta\, x^{\delta-1},\ 0 \le x \le 1$$

δ varies by insured according to a gamma distribution with $\alpha = 3$, $\theta = 3$. A loss size of 0.75 is observed. Determine the posterior estimate of δ using zero-one loss fuction. ______

Answer:

Make comment or override grade

Incorrect
Correct answer: 4.8308
Marks for this submission: 0/1.

7
Marks: 1

A Bayesian analysis is performed. The posterior density funtion is
$\pi(\theta|x)$
$= 1.0\ \theta\ \ 0 \le \theta \le 20/30$
$= 0.8571 - 0.28570\ \ 20/30 \le \theta \le 3.0$
Find the lower bound of the 95% HPD credibility interval. ______

Answer:

Make comment or override grade

Incorrect
Correct answer: 0.1491
Marks for this submission: 0/1.

8
Marks: 1

You are given the following:

- Claim sizes for a given policyholder follow a distribution with density function

$$f(x|\backslash\theta) = 6x^5/\theta^6,\ 0 < x < \theta.$$

- The prior distribution of Θ has density function

$$\pi(\theta) = 8/\theta^9, \theta > 1.$$

The policyholder experiences three claim sizes of 100, 700, 900. Find the upper bound of the 95% "HPD" credible set for θ. ______

Answer:

Make comment or override grade

Incorrect
Correct answer: 1009.91

Marks for this submission: 0/1.

9
Marks: 1

An insured's number of claims per year follows a Poisson distribution with mean λ. λ varies in accordance with a gamma distribution with α = 36 and θ = 0.01. You have the following information on the number of claims made by an insured in the past 6 years:

1, 2, 2, 4, 2, 1

Calculate the predictive variance of the number of claims per year for this insured. ______

Answer:

Make comment or override grade

Incorrect
Correct answer: 0.457102

Marks for this submission: 0/1.

10
Marks: 1

The number of claims per year on an insurance coverage has a binomial distribution with parameter m = 4 and Q. Q varies by insured and is distributed according to the following density function: $f(q) = cq(1 - q)^6$, $0 \le q \le 1$, where c is a constant. An insured submits 1 claims in 9 years. Calculate the Bayes estimate of Q(1-Q). ______

Answer:

Make comment or override grade

Incorrect
Correct answer: 0.23368

Marks for this submission: 0/1.